

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 47

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HIDEO ITOZAKI, KEIZO HARADA, NAOJI FUJIMORI,
SHUJI YAZU and TETSUJI JODAI

Appeal No. 95-3312
Application 08/167,437¹

HEARD: JUNE 8, 1998

Before THOMAS, WEIFFENBACH and OWENS, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the examiner's final rejection of

¹ Application for patent filed December 14, 1993. According to appellants, the application is a continuation of Application 07/939,050, filed September 3, 1992, now abandoned.

claims 6-13 and 26. Claims 14-22, which are the only other claims remaining in the application, have been withdrawn from consideration by the examiner as being directed toward a nonelected invention.

THE INVENTION

Appellants claim a composite comprised of a specified substrate having thereon an MgO buffer layer on which is disposed a thin film of a specified superconducting material. Claim 26 is illustrative and reads as follows:

26. A semiconductor substrate-superconducting thin film composite comprising a single crystal semiconductor substrate, a superconducting thin film layer of compound oxide and an MgO buffer layer interposed between said semiconductor substrate and said superconducting layer, wherein said semiconductor substrate is made of a semiconductor selected from the group consisting of 3C-SiC, 6H-SiC, GaAs, GaP, InP, InSb, ZnSe, CdTe, HgCdTe, GaInAs, InAlAs and InGaAsP and said compound oxide is composed of at least one element selected from Group IIa of the Periodic Table, at least one element selected from Group IIIa of the Periodic Table, and copper.²

THE REFERENCES

² In claim 26 it appears that "Group IIIa" should read "Group IIb" and that appellants' specification should be corrected accordingly. Note that on page 6 of the specification, third to fifth lines from the bottom, the listed elements are in Group IIb rather than Group IIIa as stated in the fifth line from the bottom.

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Ray	4,892,861	Jan. 9, 1990
Henty	4,931,424	Jun. 5, 1990

Toshiyuki Aida et al., "Preparation of $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ Superconducting Thin Films by RF-Magnetron Sputtering", 26 *Japanese J. Appl. Phys.* L1489-91 (Sept. 1987) (Aida).

S.Y. Lee et al., "Microprobe Characterization of Sputtered High T_c Superconducting Films on Si and SiTiO_2 ", Am. Vacuum Soc'y 34th Nat'l Symp. (Anaheim, Cal., Nov. 2-6, 1987), in *Am. Inst. Phys. Conf. Proc. No. 165*, 427-34 (James M.E. Harper et al. eds., New York 1988) (Lee).³

M. Gurvitch and A.T. Fiory, "Preparation and substrate reactions of superconducting Y-Ba-Cu-O films", 51 *Appl. Phys. Lett.* 1027-29 (Sept. 1987) (Gurvitch).

P.A. Morris et al., "Growth of high T_c superconducting $\text{Bi}_4(\text{Ca},\text{Sr})_6\text{Cu}_4\text{O}_{16+x}$ crystals", 53 *Appl. Phys. Lett.* 249-51 (July 1988) (Morris).

THE REJECTIONS

Claims 10, 11 and 26 stand rejected under 35 U.S.C. § 103 as being unpatentable over Henty in view of Lee and Aida.

Claims 6-9, 12 and 13 stand rejected under 35 U.S.C. § 103 as being unpatentable over these references, and further in view

³ Our consideration of Lee is based on the entire article, a copy of which is provided to appellants with this decision.

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of Gurvitch, Morris and Ray.

OPINION

We have carefully considered all of the arguments advanced by appellants and the examiner and agree with appellants that the aforementioned rejections are not well founded. Accordingly, these rejections will be reversed.

The examiner argues that Lee teaches that it was known to use a buffer layer of an insulating material such as zirconium oxide between a superconducting layer and the supporting substrate (answer, page 4). We do not find in Lee any indication that the disclosed zirconium oxide is merely an example of a larger class of suitable buffer layer materials as asserted by the examiner. Lee does not disclose use of any buffer layer material other than zirconium oxide.

Also, Lee does not teach that a buffer layer is needed between a superconducting layer and the particular substrate materials recited in appellants' claims. The examiner argues that appellants' disclosure indicates that a buffer layer used for a silicon substrate may also be formed between other semiconductor substrates and a superconducting film (answer,

page 10). This argument is not well taken because appellants' specification is not prior art.

The examiner argues that Aida discloses depositing superconducting thin films on different substrates such as MgO and shows that there is minimal reaction between the two layers and that superconducting properties will not deteriorate if a

superconducting layer is formed adjacent to MgO layer (answer, page 4). Aida teaches that $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ and MgO have similar coefficients of thermal expansion (Table 1, page L1490) and that a film of a $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ superconductor on an MgO substrate has a critical temperature of 81K (page L1489). We do not find in Aida, however, a teaching that there is minimal reaction between MgO and a $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ superconductor layer, as asserted by the examiner.

The examiner argues that Lee's zirconium oxide buffer layer has minimal reaction with the superconducting layer and that it would have been obvious to one of ordinary skill in the art to substitute other insulating films, such as MgO, as

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	CAMERON WEIFFENBACH)	BOARD OF
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